

Preliminary Amendment

Applicant: Wolfgang Hetzel et al.

Serial No.: Unknown

(Priority Application No. DE 103 50 239.4)

(International Application No. PCT/DE2004/002374)

Filed: Herewith

(Priority Date: October 27, 2003)

(International Filing Date: October 25, 2004)

Docket No.: I431.156.101/FIN546PCT/US

Title: SEMICONDUCTOR DEVICE WITH PLASTIC PACKAGE MOLDING COMPOUND,
SEMICONDUCTOR CHIP AND LEADFRAME AND METHOD FOR PRODUCING THE SAME

IN THE CLAIMS

Please cancel claims 1-15 without prejudice.

Please add claims 16-35 as follows:

~~Patent Claims~~ WHAT IS CLAIMED IS:

1-15. (Cancelled)

16. (New) A semiconductor device comprising:

a plastic package molding compound;

a semiconductor chip;

a leadframe, the semiconductor chip being embedded in the plastic package molding compound, an upper side of the semiconductor chip and the plastic molding compound are arranged on the leadframe; and

a elastic adhesive layer being arranged between the plastic package molding compound and the leadframe, and between the semiconductor chip and the leadframe, configured for mechanical decoupling of an upper region from a lower region of the semiconductor device.

17. (New) The semiconductor device as claimed in claim 16, comprising wherein peripheral regions of the semiconductor device are free of the elastic adhesive layer.

18. (New) The semiconductor device as claimed in claim 17, comprising wherein peripheral regions of the semiconductor device are free of the elastic adhesive layer comprise elastic metal layers.

19. (New) A semiconductor device comprising:

a plastic package molding compound;

a semiconductor chip;

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a leadframe, the semiconductor chip being embedded with one of its two upper sides and its peripheral sides in the plastic package molding compound, and the other of its two upper sides being surface-mounted on an upper side of the leadframe, and the region of the upper side of the leadframe that is not covered by the semiconductor chip being covered by the plastic package molding compound; and

a continuous elastic adhesive layer arranged between the plastic package molding compound and the leadframe, and between the semiconductor chip and the leadframe, on the upper side of the leadframe.

20. (New) The semiconductor device as claimed in claim 19, comprising wherein peripheral regions of the semiconductor device are free of the elastic adhesive layer.

21. (New) The semiconductor device as claimed in claim 20, comprising wherein the peripheral regions of the semiconductor device that are kept free of the adhesive layer comprise elastic metal layers.

22. (New) The semiconductor device as claimed in claim 21, comprising wherein the metal layers comprise a copper layer of a copper alloy arranged on the leadframe and a gold layer of a gold alloy applied on top of it.

23. (New) The semiconductor device as claimed in claim 21, characterized in that the metal layers comprise a copper layer of a copper alloy arranged on the leadframe and a gold layer of a gold alloy applied on top of it.

24. (New) The semiconductor device as claimed in claim 21, comprising wherein the metal layers comprise a copper layer of a copper alloy arranged on the leadframe and a silver layer of a silver alloy applied on top of it.

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25. (New) The semiconductor device as claimed in one of claim 24, comprising wherein the width of the metal layers in the peripheral regions of the semiconductor device are adapted to the width of sawing tracks in such a way that the elastic adhesive layer is not exposed to the sawing process in the production of peripheral sides of the semiconductor device.

26. (New) The semiconductor device as claimed in one of claim 21, comprising wherein the width of the metal layers in the peripheral regions of the semiconductor device are adapted to the width of sawing tracks in such a way that the elastic adhesive layer is not exposed to the sawing process in the production of peripheral sides of the semiconductor device.

27. (New) A panel, comprising device positions with semiconductor devices arranged in rows and columns, as claimed in claim 16.

28. (New) The panel as claimed in claim 27, comprising wherein peripheral regions of the semiconductor device are free of the elastic adhesive layer.

29. (New) The semiconductor device as claimed in claim 28, comprising wherein the peripheral regions of the semiconductor device that are kept free of the adhesive layer comprise elastic metal layers.

30. (New) A method for producing a panel with a plastic package molding compound, semiconductor chips and a leadframe in a number of semiconductor device positions, the method comprising:

producing a leadframe with device positions arranged in rows and/or columns;

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applying an elastic adhesive layer, covering both the region of the intended semiconductor chip and the region of the intended plastic package molding compound on an upper side of the leadframe in the device positions;

adhesive attachment of semiconductor chips onto the adhesive layer in the device positions;

establishing electrical connections between contact areas of the semiconductor chip and the leadframe in the device positions; and

applying a plastic package molding compound to the adhesive layer while embedding the semiconductor chips and while forming a panel with a number of semiconductor device positions.

31. (New) The method as claimed in claim 30, comprising wherein a pattern of metal layers, which covers more than the width of the sawing tracks with the metal layers, and having a width in the range of 1.2 times to 3 times the width of the sawing tracks, is applied to the leadframe before the application of the adhesive layer.

32. (New) The method as claimed in claim 30, comprising wherein a central opening for a bonding channel is introduced in the device positions of the leadframe when the leadframe is produced.

33. (New) The method as claimed in claim 30, comprising wherein the semiconductor chip is applied with its active upper side to the adhesive layer of the leadframe while aligning contact areas of the semiconductor chip arranged in two rows over the central opening of the leadframe, and bonding wires for connecting the contact areas of the semiconductor chip to bonding fingers of a wiring structure are attached on the rear side of the leadframe in the device positions.

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producing of a panel with a plastic package molding compound,
semiconductor chips and a leadframe in a number of semiconductor device positions,
the method of producing the panel comprising:

producing a leadframe with device positions arranged in rows and/or columns;

applying an elastic adhesive layer, covering both the region of the intended
semiconductor chip and the region of the intended plastic package molding compound
on an upper side of the leadframe in the device positions;

adhesive attachment of semiconductor chips onto the adhesive layer in the
device positions;

establishing electrical connections between contact areas of the semiconductor
chip and the leadframe in the device positions; and

applying a plastic package molding compound to the adhesive layer while
embedding the semiconductor chips and while forming a panel with a number of
semiconductor device positions;

comprising wherein a pattern of metal layers, which covers more than the
width of the sawing tracks with the metal layers, and has a width in the range of 1.2
times to 3 times the width of the sawing tracks, is applied to the leadframe before the
application of the adhesive layer;

dividing up of the panel into individual semiconductor devices along sawing tracks;

and

applying external contacts to the individual semiconductor device.

35. (New) A semiconductor device comprising:

a plastic package molding compound;

a semiconductor chip;

a leadframe, the semiconductor chip being embedded with one of its two upper sides
and its peripheral sides in the plastic package molding compound, and the other of its two
upper sides being surface-mounted on an upper side of the leadframe, and the region of the

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upper sides being surface-mounted on an upper side of the leadframe, and the region of the upper side of the leadframe that is not covered by the semiconductor chip being covered by the plastic package molding compound; and

means for providing an elastic adhesive layer arranged between the plastic package molding compound and the leadframe, and between the semiconductor chip and the leadframe, on the upper side of the leadframe.